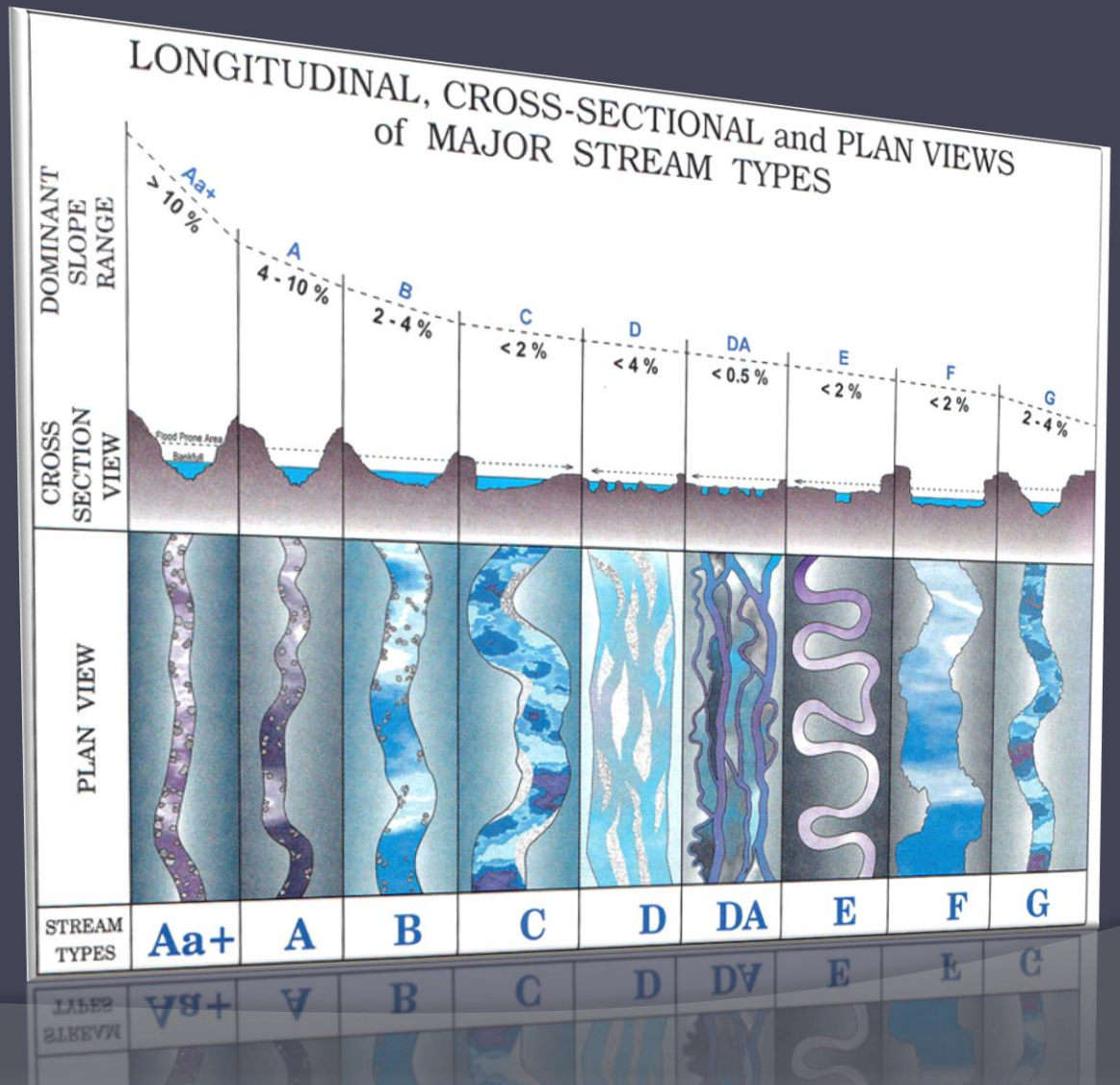
MD 24 (Rocks Road) Slope Repair Project Priority Sections

Stream Evaluation & Slope Stabilization Techniques

Overview

- Stream Classification Methodology
- Highway Drainage and Challenges
- Water Quality Benefits
- General Stabilization Techniques
- Summary of Challenges

Stream Engineering Classification



Engineering classification system riverine systems

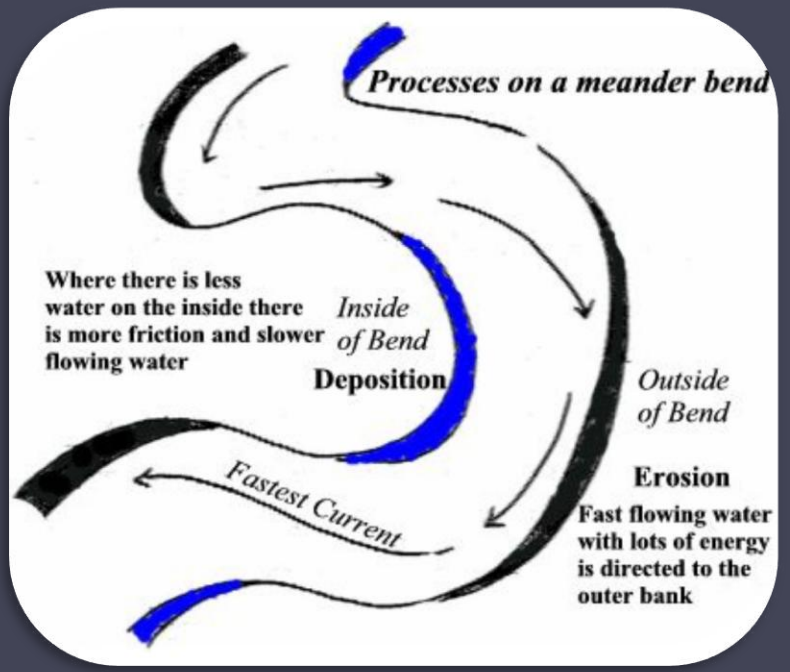
Not biological assessment system.

Detailed engineering studies Oriented studies

Highly Specific to Location

Stream Engineering & Construction

- Control Work Site
- Qualified & experienced Contractors
- Constant Oversight
- Quality Assurance
- 5-Year Monitoring



Stream Dynamics

Outside of Bend = Erosion
Inside of Bend = Deposition

Water Quality Opportunities

Deer Creek Watershed Restoration Action Strategy - "The goal of the WRAS is to protect water quality, conserve fish and wildlife habitats, and restore those areas found to be impaired… *We envision a healthy, vibrant Deer Creek Watershed by preserving high quality streams and rivers supportive of diverse aquatic life and conserving our treasured natural resources for this and future generations. We celebrate today's rural legacy of farms, forests, historic villages, and scenic parklands.*"

Development Goal - *Utilize sustainable development and implementation approaches to manage impervious surfaces and protect water quality….*

Objective -Reduce the impact of existing development on water quality and natural resources.

Evaluate and identify stormwater management projects on public properties

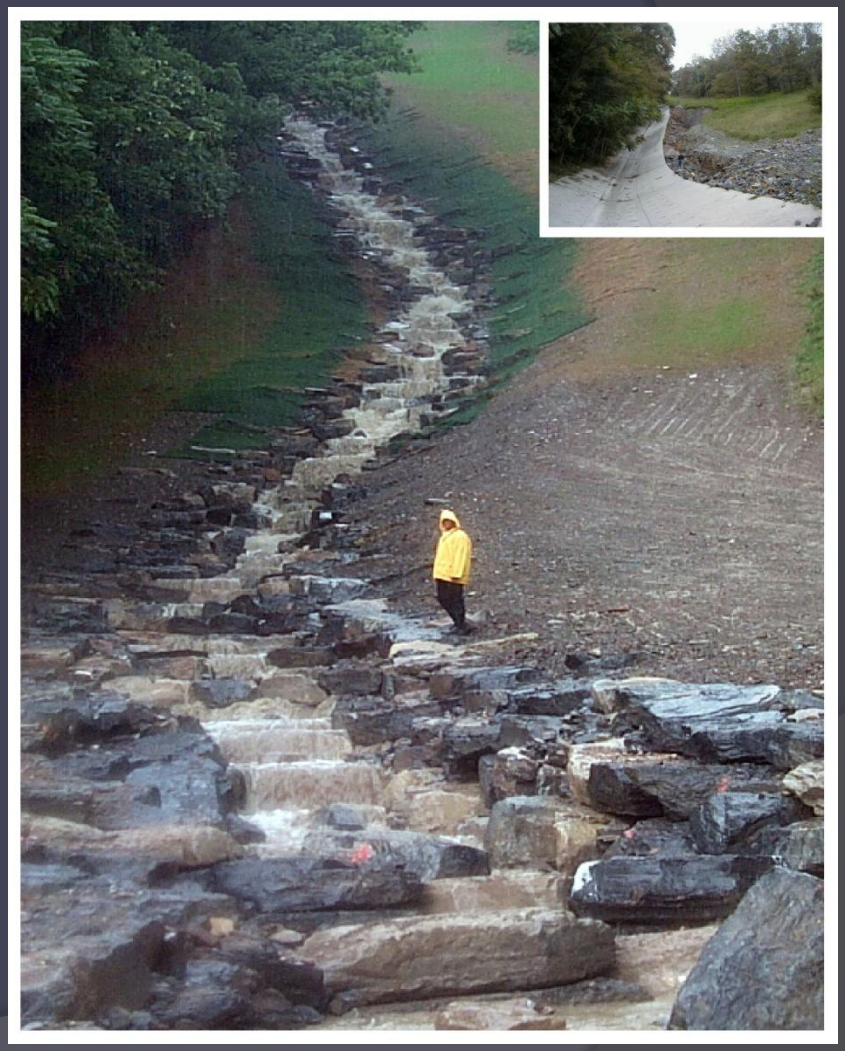
- Use sites as demonstration projects

Partnering to achieve this common goal is needed.

Example SHA Project –

Porter Run (Tributary to Braddock Run)

Western Maryland -*Concrete Channel*



Evaluation of Deer Creek within Area of Interest

The existing conditions of Deer Creek were found to be incised, degraded and laterally unstable. The effects of past channel manipulation from damming, channel relocation, railroad impacts, and roadway infrastructure within a confined valley setting have contributed to past stream degradation and is likely to contribute to ongoing degradation in the future. **This process of channel migration should be expected to continue for the foreseeable future**.

- From SHA Geomorphic Study

Highway Stormwater Challenges

Convey of highway runoff
Reduce sediments from vehicular traffic
Provide safe travel way during rain events by reducing ponding

Closed system = inlets and pipes
Open System = ditches and channels

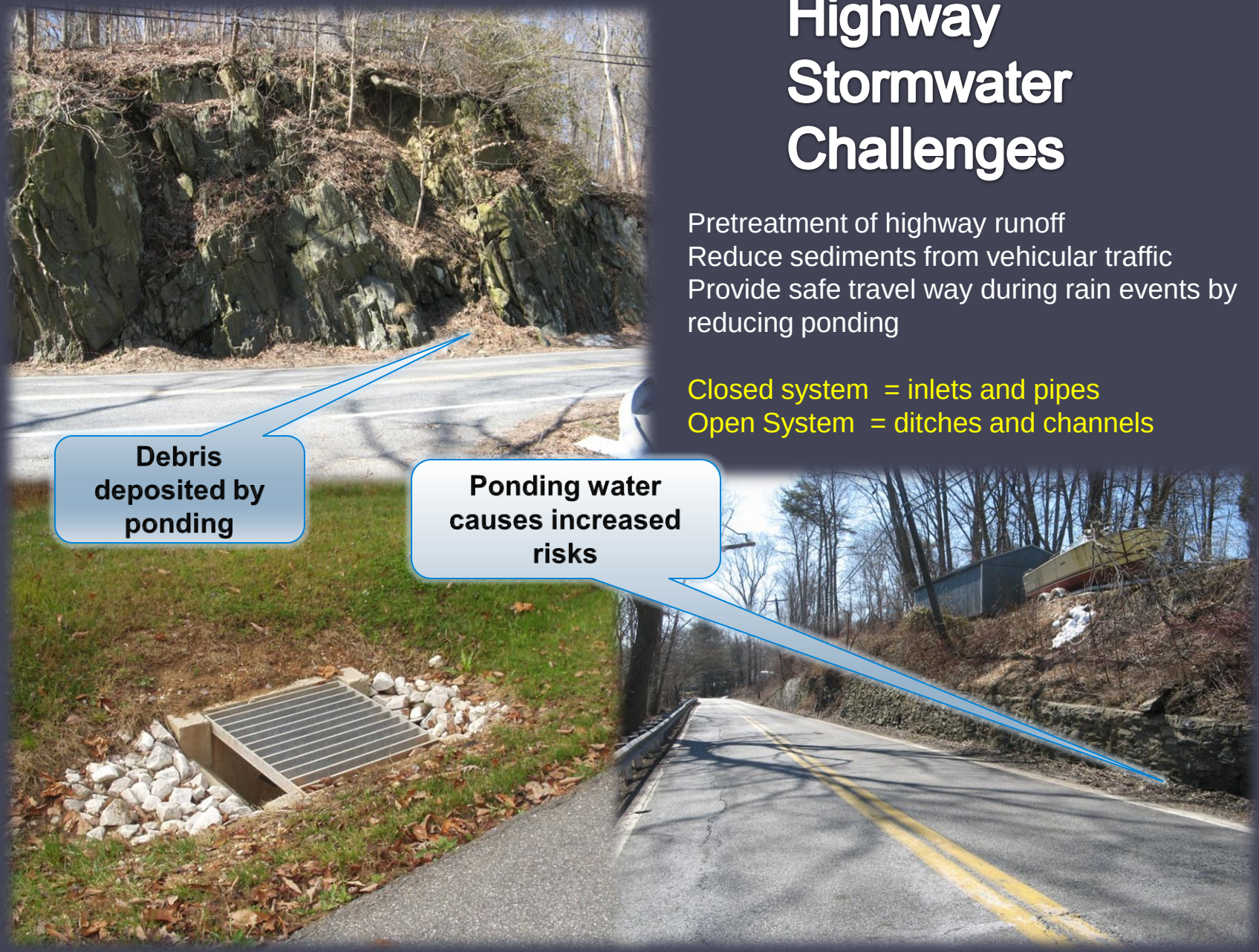
Area of Concern
Ponding water causes increased risks

Very flat, light rain may cause larger risks.

Highway Stormwater Challenges

Pretreatment of highway runoff
Reduce sediments from vehicular traffic
Provide safe travel way during rain events by reducing ponding

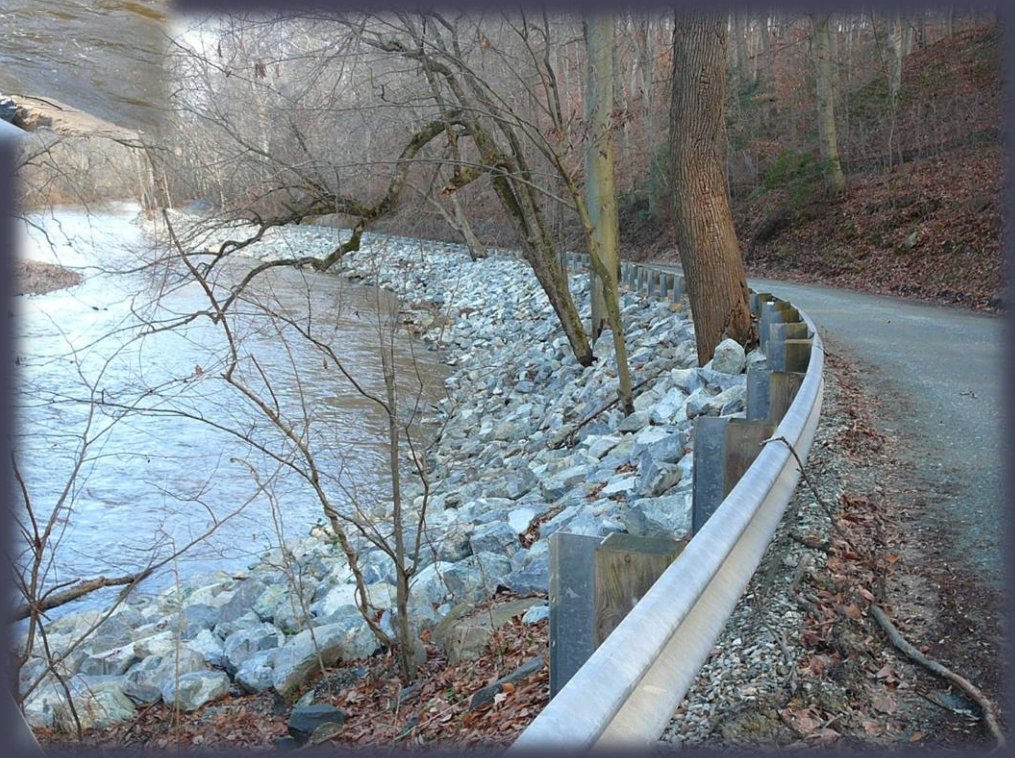
Closed system = inlets and pipes
Open System = ditches and channels



Example –
Slope Protection Techniques

Rock Riprap

- Loose irregular rock randomly placed along stream bank
- Currently most common stabilization technique
- May have landscape veneer
- Looks engineered.
- Promotes infiltration
- Maximum Slope = 2:1



Riprap Slope on Harmony Church Road along Deer Creek, near MD 136

Gabions

- Wire mesh boxes filled with stone or other materials.
- Replaces need for larger individual stones
- Wire mesh can degrade over time in saturated conditions.
- Constant contact with river not recommended.
- Able to be planted and landscaped.

Imbricated Stone Wall

MD139 Charles Street

MD139 Charles Street

- Regular shaped, Stacked
- Natural stone
- Offset and terracing
- Skilled workmen only
- Increases fauna possibly over concrete or modular

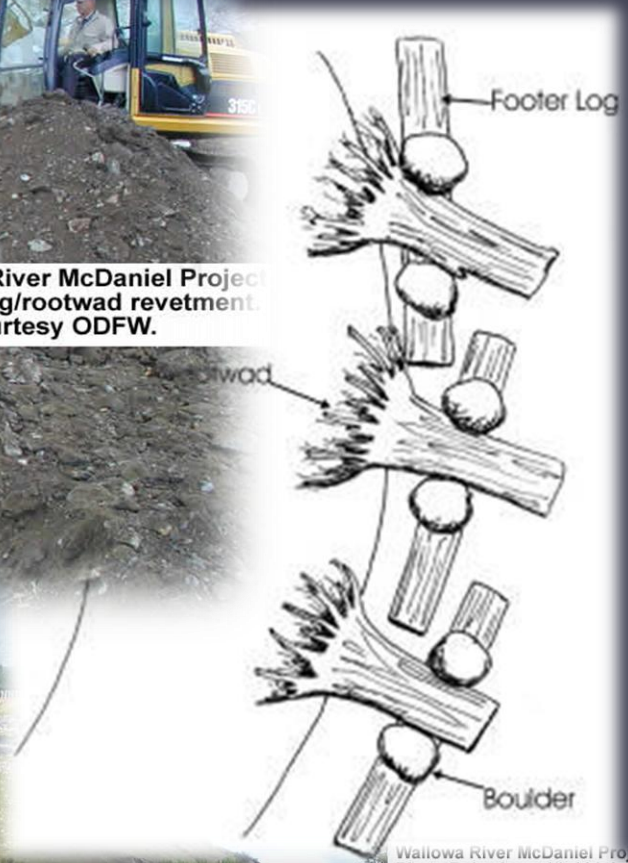
Concrete/ Modular Wall

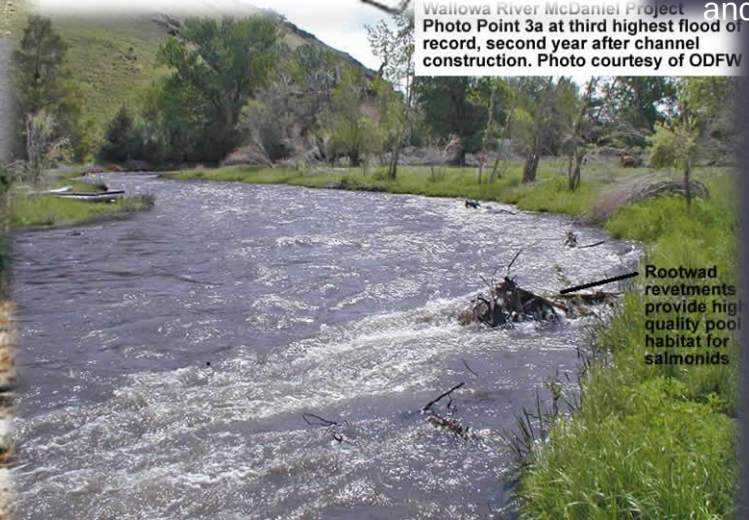
- Poured Concrete or Modular block wall
- Stacking systems
- Possible to use form liner and stains to simulate stone or roach formations
- Extensive work zone and disturbance
- Long period of construction
- Vertical Wall

High Performance Turf Matting

- Underlining structure may be riprap
- Not typically used in riverine applications
- May be used in combination
- Used in conjunction with other methods
- Anchors are placed to hold slope..
- Max slope = 2:1
- Disturbance area is large due to the anchor placement.

Log Cribbing & Root wad Revetment



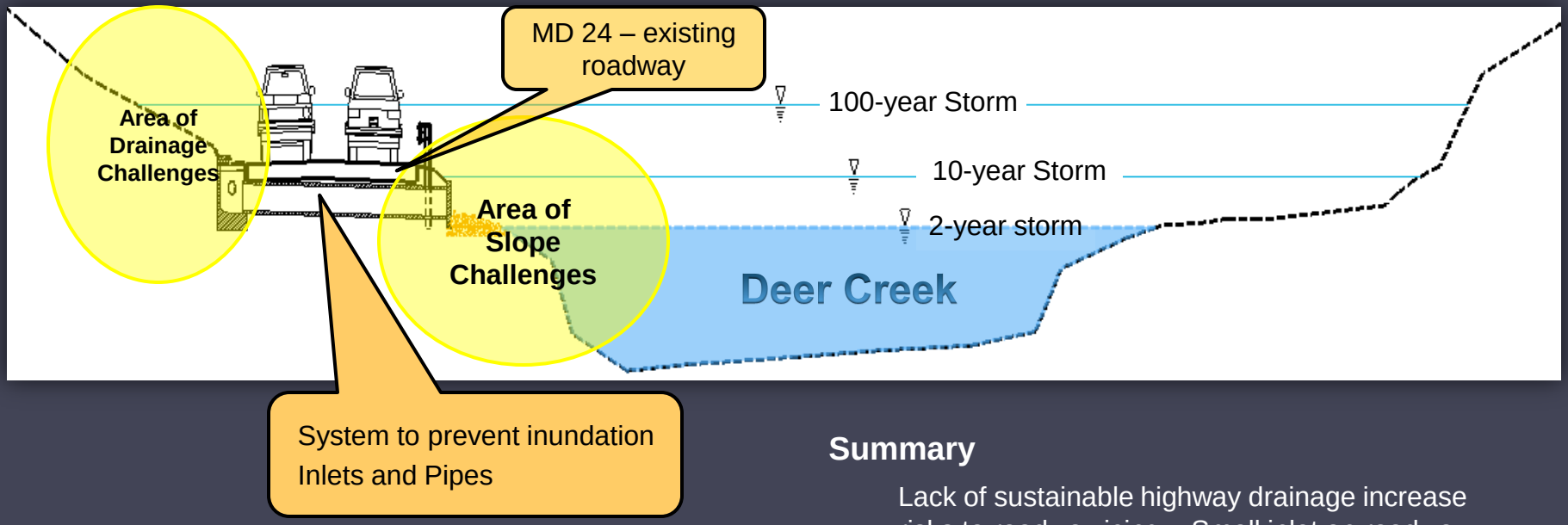


- Harvested Logs
- Normal used for on -site logging operation
- Used in remote, western US
- Appears as debris in stream
- Used in combination with other methods.
- Area of disturbance is similar to anchors for matting application.

Floodplain Adjustments

- Lower outside meander stress
- Full Design option only. Complete restoration and river prediction.
- Temporary impact to riparian buffers.
- Restore to existing condition with provisions for the modern watershed development.
- Planting of riparian buffers
- Natural looking

Summary of Challenges



Summary

Lack of sustainable highway drainage increase risks to roadway icing . Small inlet on roadway edges to convey water.

Slope stabilization techniques can use in combination to achieve the common goal.

Collective ideas will solve the challenges and provide beneficial results.

Past
(1934)

Present
(actually a few weeks ago)

Thank You